

The following Listing of Claims replaces all prior listings, and versions, of claims in the subject patent application.

Listing of Claims:

1 (currently amended): An ultrasonic insert comprising:

- an elongated body having first and second body ends and a central axis;
- a treatment applying tip region ~~coupled to~~ carried by the first end, the tip region having a tip end displaced from the first end;
- a transducer coupled to the second end;
- an internal fluid flow channel formed at least in part in the body, extending at an angle to the central axis and having first and second fluid flow ends with one flow end located on the body between the first and second body ends with the other flow end located in the tip region, closer to the tip end than is the one flow end; and
- a transverse channel formed in the body adjacent to the one flow end and which intersects the flow channel.

2 (currently amended): An insert as in claim 1 where the other flow end is located on the tip region between the first body end and the tip end.

3 (original): An insert as in claim 2 where the other flow end comprises an elongated opening.

4 (original): An insert as in claim 1 which includes one of a piezoelectric or a magnetostrictive transducer coupled to the second end.

5 (original): An insert as in claim 1 where the transverse channel intersects an external periphery of the body and is off-set from the one flow end.

6 (canceled).

7 (currently amended): An insert as in claim 5 where the transverse channel has a width parameter and a depth parameter, at least one of the parameters selected to establish a selected fluid flow rate from the other flow end in the presence of a predetermined fluid pressure.

8 (original): An insert as in claim 7 where the depth parameter is in a range of 0.018 to 0.020 inches.

9 (original): An insert as in claim 7 where the width parameter is in a range of 0.013 to 0.015 inches.

10 (original): An insert as in claim 1 where the other flow end comprises a spray controlling indentation formed in an exterior surface of the tip region.

11 (original): An insert as in claim 1 which includes a flow shut off valve, carried on the body, to terminate flow from the tip region in response to a selected condition.

12 (original): An insert as in claim 1 which carries a rotary bearing coupled to the body.

13 (original): An insert as in claim 7 which carries a rotary bearing coupled to the body.

14 (original): An insert as in claim 1 which carries an elastomeric handle.

15 (original): An insert as in claim 12 which carries an elastomeric handle, at least in part adjacent to the bearing.

16 (original): An insert as in claim 13 which carries an elastomeric handle, at least in part adjacent to the bearing.

17 (original): An insert as in claim 15 where the bearing has first and second bearing parts rotatable relative to one another, the handle and tip region are rotatable together relative to one of the bearing parts.

18 (original): An insert as in claim 16 where the bearing has first and second bearing parts rotatable relative to one another, the handle and tip region are rotatable together relative to one of the bearing parts.

19 (original): An insert as in claim 17 which carries a fluid shut off responsive to low fluid flow.

20 (original): An insert as in claim 19 which includes at least one indentation on the tip region for control of a spray pattern.

21 (currently amended): A dental treatment applying apparatus comprising:

a handle that carries an ultrasonic transducer;

an elongated main body having a vibrating treatment applying tip portion, the elongated main body coupled to the transducer, an internal flow channel is formed at ~~at least~~ least in part in a portion thereof the elongated main body, the channel having at least first and second sections that intersect to form a fluid inlet into the channel of a size to provide a flow rate less than 25 cc/min with fluid pressure in a selected range ~~with fluid pressure in a selected range.~~

22 (original): An apparatus as in claim 21 where the sections are substantially perpendicular to one another.

23 (original): An apparatus as in claim 22 where one section terminates at a fluid flow output port in the tip portion.

24 (currently amended): An apparatus as in claim 21 where the ~~tip portion~~ elongated main body and the transducer are removably coupled to the handle.

25 (canceled).

26 (currently amended): An apparatus as in claim ~~25~~ 21 where one section extends from the tip portion ~~to of the body member~~ to a portion of the body member closer to the transducer than the tip portion, with the second section intersecting the first section in the body member.

27 (original): An apparatus as in claim 26 where the intersection of the sections defines a fluid inlet port for one of the sections.

28 (currently amended): An apparatus as in claim 27 which includes a two part rotary bearing with one part fixedly coupled to the body member and the other part rotatable relative thereto.

29 (currently amended): An apparatus as in claim 28 where the other part ~~slidable~~ of the rotary bearing slidably engages the handle with the tip portion rotatable relative thereto.

30 (original): An apparatus as in claim 27 where the body member includes a pressure responsive fluid shut off valve.

31 (original): An ultrasonic insert comprising:

a body portion having first and second spaced apart ends and an integrally formed tip section, the tip section is carried by the body portion adjacent to one of the ends, and an internal fluid flow channel which extends between the body and the tip section, with a transverse slot formed in the body which intersects a body-end of the channel forming a fluid input to the channel, the channel terminating at a fluid flow output on the tip section.

32 (original): An insert as in claim 31 which includes an ultrasonic transducer coupled to the other end.

33 (original): An insert as in claim 31 which includes a restricted fluid input which limits fluid output at the tip section to less than 25 cc/min with an applied fluid pressure in a selected range.

34 (original): An insert as in claim 31 where the tip section defines a fluid spray shaping region adjacent to the output.

35 (original): An insert as in claim 31 where the body section includes a pressure responsive flow shut off valve.

36 (original): An insert as in claim 31 which carries a rotary bearing on the body portion.

37 (original): An insert as in claim 33 where the selected range is in the order of 2.5-5.5 psi.

38 (original): A low flow ultrasonic insert comprising:

a body having first and second ends and a central axis, one end terminates in a selected tip region, the other end terminates at an ultrasonic transducer, a lateral slot is formed in the body, the lateral slot intersects a generally axially oriented channel formed in part in the body that extends to and terminates at the tip region, the channel extends at an angle to the axis, the channel terminates within the body proximate to the lateral slot, the intersection of the slot and the channel forms a fluid inflow port, the channel termination at the tip geometry forms a fluid outflow port providing a fluid flow output rate less than 25 cc/minute, with a fluid pressure in a range of 3-5 psi.

39 (original): An insert as in claim 38 where the slot has a width in a range of 0.011 to 0.17 inches.

40 (original): An insert as in claim 38 where the slot has a depth parameter in a range of 0.016 to 0.022 inches.

41 (original): An insert as in claim 39 where the slot has a depth parameter in a range of 0.016 to 0.022 inches.

42 (original): An insert as in claim 38 where the channel has a diameter in a range on the order of 0.010 to 0.018 inches.

43 (original): An insert as in claim 41 where the channel has a diameter in a range on the order of 0.010 to 0.018 inches.

44 (original): An insert as in claim 38 which carries a rotary bearing with the tip region rotatable relative to a selected region of the bearing.

45 (original): An insert as in claim 43 which carries a rotary bearing with the tip region rotatable relative to a selected region of the bearing.